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A new species of Epinannolene from the Amazon Basin, Brazil (Spirostreptida: Pseudonannolenidae)

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Among several species of milliped taken in enormous numbers by Dr. Joachim Adis during his studies of innundation-forest animals at Manaus, Brazil, is an apparently undescribed form of *Epinannolene*. In order to facilitate reference to this organism in publication of his on-going research findings, Dr. Adis has requested that I provide a specific name, which is bestowed in this paper. The name reflects the fact that the creature spends a large part of the year (during the flood periods) high up in trees and could even be considered as a facultative dendrobite.

Epinannolene.

Epinannolene Brolemann, 1903, Ann. Soc. ent. France, vol. 72, p. 135. Type species, *E. pittieri* Brolemann, by monotypy.

So far about 25 species have been referred to this genus, some of them perhaps synonymous with others. The generic distribution is very characteristic, from Ecuador to Costa Rica, eastward to Trinidad and most of the Antilles. So far no species have been found on Jamaica, a noteworthy situation. A similar distribution is to be seen in *Stemmiulus*, and to a considerable extent, also in *Glomeridesmus*. Heretofore it has been assumed that all of the known taxa are separate species, but a different approach was recently taken by Mauriés (1980) in regarding two forms from Guadeloupe as subspecies of *E. pittieri*. Certainly the form of the male genitalia tends to be fairly uniform throughout the genus, and perhaps reliance upon these appendages would lead to opinions not anticipated in the light of phylogeographic assumptions. Mauriés' initiative certainly merits a close examination, as it is by no means impossible that some species may have been spread around the West Indes by commerce and that endemism may not be automatically assumed for each island. At the same time, a close search for distinguishing characters in other structural systems may reveal useful details for separating species and constructing phylogenies.

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Already in the description of the genus and its type species, Brolemann (1903: 138, fig. 5) noted the presence, on some anterior legs of the male, of ". . . appendices de nature pileuse, greles a la base et epanouis a l'extremite. . .". These modified setae were described again by Carl (1914) and are utilized here in the definition of the new Amazonian species. Their biological significance (and taxonomic reliability) remains to be established.

Epinannolene arborea, new species. — Figures 1-5.

Material:| Several hundred specimens from the vicinity of Manaus, Edo. Amazonas, Brazil, all collected by J. Adis in traps attached to tree trunks. The type series (male holotype, many male and female paratypes) was taken on 2 September 1976. Holotype and paratypes (INPA), other paratypes in MZUSP and the author's collection.

Diagnosis: Differing from all known species of the genus, except *E. alticola* (Silvestri, 1898) in having the apex of the telopodite drawn out into a long flagellum (Fig. 2). From *alticola, E. arborea* differs in the much smaller number of modified setae on ventral surface of postfemora and tibiae: 5-6 as opposed to 10-15 per podomere, as well as in small details of gonopod structure (e.g., much longer flagellum).

Holotype: Adult male with 52 segments. Body slender, ca. 30 mm long (broken and curved), 1.2 mm in diameter; L/W ratio ca. 4%. Segments 3-5 smaller than 2 and 6, 6th and 7th largest, following segments of equal diameter back to antepenultimate. Metazona only slightly greater in diameter than prozona, thus segments minimally telescoped. Interzonal construction relatively prominent.

General coloration overall light yellowish-brown, collum and telson a little darker. Each segment with a large lateral dark spot on prozona in front of ozopore (thus corresponding to internal location of ozadene), and a smaller spot in similar position on metazona, the anterior of these two spots connected across the dorsum by a thin dark line on caudal edge of prozonum. Two middorsal black spots: one larger centered on metazona (not touching its caudal edge) and a smaller one on prozona. At low magnification animals appear to be trilineate. Front of head, basal antennomeres, and legs uniformly clear yellow; distal antennomeres infuscated with diffuse light brown. Most of collum and lateral parts of metazona of anteriormost segments lightly reticulated with dark brown network.

Head evenly convex, smooth, nearly glabrous: 2+2 clypeal setae and about 8+8 labral setae. Interantennal space wide, about equal to length of first three antennomeres. Latter increasing in width up to 6th which is about as broad as long, with corresponding increase in pilosity. Ocelli flat, indistinct, in five series: 12-11-9-7-4 = 41.

Body segments smooth, without vestiture, the entire surface with minute texture of isodiametric meshwork. Pores relatively large, near midlength of metazona. Lower sides of metazona with about 12-14 faint striae, the uppermost well below level of pores. Terminal segments without modification; free edges of paraprocts forming re-entrant angle.

Legs relatively long and slender, length somewhat greater than body diameter; tibiae and postfemora of anterior legs, back to about middle of body, with 5-6 modified setae (Fig. 1) on the ventral side; beyond midbody the number of setae is gradually reduced, posteriormost legs with only a single such seta at apical end of tibia and postfemur.

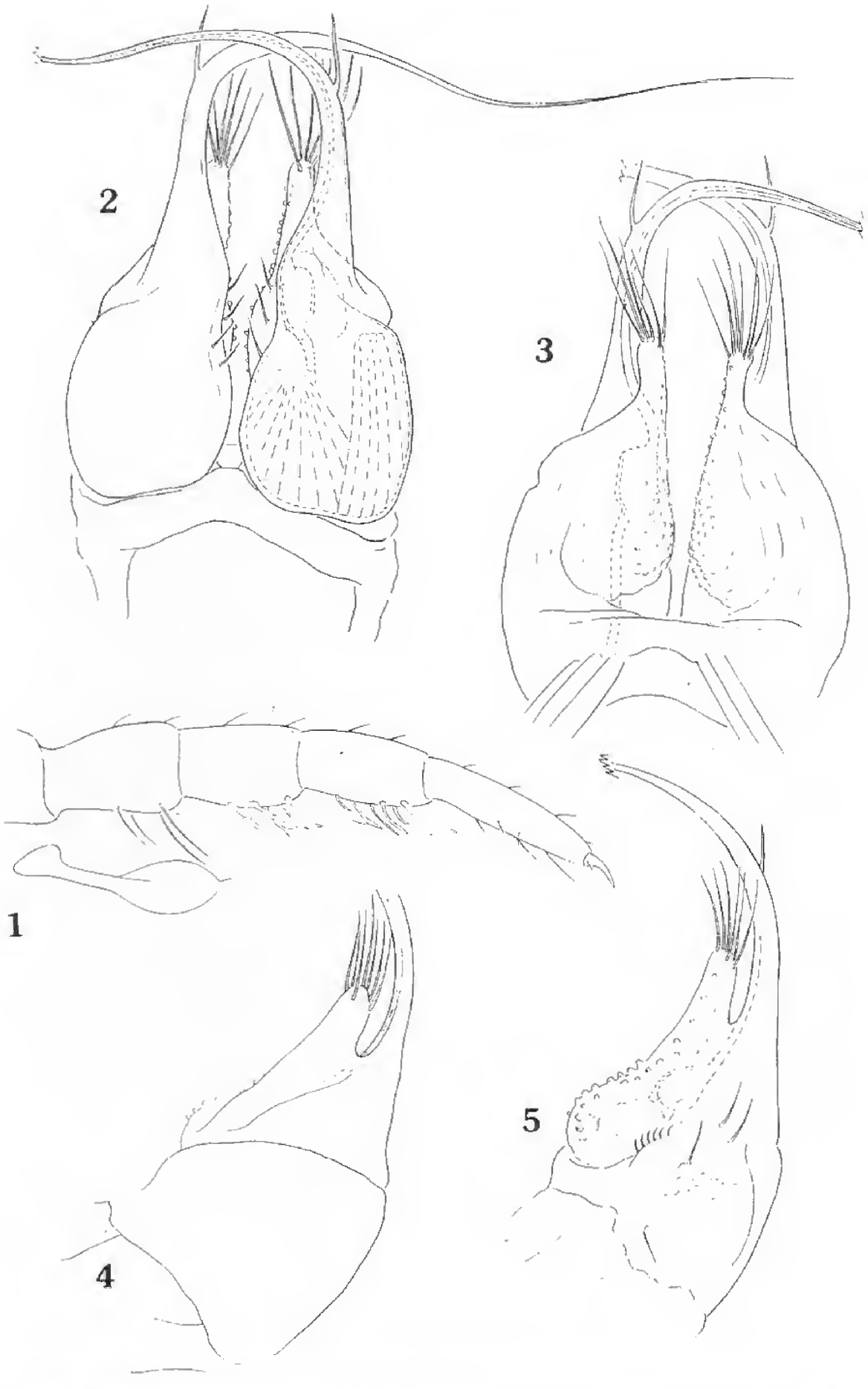

Fig. 1. Leg from anterior segments showing modified setae of postfemur and tibia. Fig. 2. Gonopods anterior aspect. Fig. 3. Gonopods posterior aspect. Fig. 4. Base of left gonopod, lateral aspect. Fig. 5. Base of right gonopod, mesal aspect.

Gonopods of the form shown in Figs. 2-5; sternal remnant greatly reduced and indistinct; coxae with numerous tubercles on inner surface, distally prolonged into digitform process with about ten apical macrosetae; no evident articulation between coxa and telopodite [in cleared preparation of paratype gonopods telopodite muscles are evident], latter drawn out into a long, slender, flagelliform projection which curves mesad and, crossing that of the other gonopod, extends far out laterad beyond body on the opposite side; this region of telopodite with a slender acuminate process near base on lateral side, just beyond tips of coxal setae.

[In a cleared paratype gonopod, the presumptive basal region of the telopodite is seen to contain two internal chamber similar to those illustrated by Carl for *E. alticola*, the more distal of the two merging into a distinct prostatic groove that extends the entire length of the telopodite].

Comments: The obvious similarity of this species to *E. alticola* invites consideration of the degree of relationship involved. As reflected in its name, *alticola* occurs, so far as known, only in the Andes of central Colombia at elevations of 2600 to 3300 meters above sea level. It is therefore surprising that a form so closely similar as *arborea* should occur in the forests of central Amazonia scarcely above sea level, and in presumably quite different biotopes. Heretofore no member of this genus has been found in the Amazonian region, and an initial inference might suggest downstream dispersal from the Andes on floating logs or debris. If *arborea* had been collected in Colombia, I would have had no difficulty regarding it a subspecies of *alticola*.

Although it is conceivable that the original area of *arborea* will be found somewhere on the southern end of the Cordillera Orientale in Columbia, the great majority of streams draining eastward from these mountains flow into the Orinoco system. Only the few headwaters of the Japura and Putamayo rivers originate in southernmost Colombia, which at least severely limits the extent of a possible source area (to the advantage of future search). Considering our present state of knowledge of Andean millipeds, further speculation on this subject appears pointless. Certainly dozens of Colombian species of *Epinannolene* remain to be discovered, as well as others in western Brazil. Some of these cannot fail to shed some light on the problem.

Information on the study area and collection techniques has been provided by Adis (1981), who considers *E. arborea* to fall in the group of organisms called "Tree animals — nonmigrants". "Reproduction exclusively in the trunk and canopy region; at most temporarily or not at all active on the forest floor during the emersion phase."

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